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WHAT IS CLAIMED IS:

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1. A flat plate heat transfer device, comprising:

a thermal-conductive flat case installed between a heat source and a heat emitting
unit and containing a working fluid which is evaporated with absorbing heat from the
heat source and is condensed with emitting heat to the heat emitting unit; and

one layer of mesh installed in the flat case and configured so that wires are woven to be alternately crossed up and down,

wherein a dispersion channel of a vapor is formed along a surface of the wire from a cross point of the mesh near the heat source, and a flow channel of a liquid is formed by means of a capillary phenomenon along a length direction of the wire from a mesh lattice near the heat emitting unit to a mesh lattice near the heat source.

- 2. The flat plate heat transfer device according to claim 1, wherein the mesh is a screen mesh with a mesh number of 10 to 60.
- 3. The flat plate heat transfer device according to claim 1, wherein the mesh is woven by wires with a diameter of 0.12 mm to 0.4 mm.
- 4. The flat plate heat transfer device according to claim 1, wherein the thermal-conductive flat case has a height of 0.3 mm to 1.0 mm.
 - 5. The flat plate heat transfer device according to claim 1, wherein the flat case is configured by combination of an upper case and a lower

25 case.

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6. The flat plate heat transfer device according to claim 1, wherein the mesh is a screen mesh, and wherein a length direction of a lengthwise wire among the wires is identical to a direction in which heat transfer is conducted.

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7. The flat plate heat transfer device according to claim 1. wherein the thermal-conductive flat case is made of electrolytic copper foil, and wherein an uneven surface of the electrolytic copper foil is configured as an inner side of the flat case.

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8. The flat plate heat transfer device according to any of claims 1 to 7, wherein the mesh is made of one selected from the group consisting of metal, polymer, plastic and glass fiber.

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9. The flat plate heat transfer device according to claim 8, wherein the metal is selected from the group consisting of copper, aluminum, stainless steel, molybdenum, and their alloys.

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10. The flat plate heat transfer device according to any of claims 1 to 7, wherein the flat case is made of one selected from the group consisting of metal, conductive polymer, metal coated with conductive polymer, and conductive plastic.

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The flat plate heat transfer device according to claim 10, wherein the metal is selected from the group consisting of copper, aluminum, stainless steel, molybdenum, and their alloys.

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- 12. The flat plate heat transfer device according to any of claims 1 to 7, wherein the flat case is sealed using a manner selected from the group consisting of laser welding, plasma welding, TIG (Tungsten Inert Gas) welding, ultrasonic welding, brazing, soldering, and thermo-compression lamination.
- 13. The flat plate heat transfer device according to any of claims 1 to 7, wherein the working fluid is selected from the group consisting of water, methanol, ethanol, acetone, ammonia, CFC working fluid, HCFC working fluid, HFC working fluid, and their mixture.